

WE CLAIM:

1. A polymer having an Erosion Rate in seawater that is suitable for use as a binder in a marine antifouling paint and having improved flexibility comprising a polymer of the formula -[A]-[B]- where A is present from above 9 to about 20 mole percent and comprises one or more XSiR₃ wherein each R may be the same or different and is a substituted or unsubstituted aryl or heteroaryl group, X is the residue of an acryloxy or methacryloxy group; and B represents the residue of two or more different ethylenically unsaturated monomers copolymerizable with A.
2. The seawater erodible polymer of Claim 1 in which at least one R is an unsubstituted aryl, an aryl group substituted with one or more chlorine, fluorine, bromine, iodine, alkyl, perfluoroalkyl, napthyl, fluorenyl, anthracenyl, phenanthrenyl, pyrenyl, alkylether, substituted alkylether, arylether, substituted arylether, amino substituted group, or mixtures thereof and the polymer is characterized by an Erosion Rate in seawater of from 2 to 15 microns per month.
3. The seawater erodible polymer of Claim 1 wherein A is triphenylsilylacrylate or triphenylsilylmethacrylate, and the polymer is characterized by an Erosion Rate in seawater of from 2 to 15 microns per month.
4. The seawater erodible polymer of Claim 1 in which at least one R is a sulfur-, nitrogen-, or oxygen-containing heteroaryl group.
5. The seawater erodible polymer of Claim 1 in which B is selected from the group

consisting of unsaturated organic acids, esters of acrylic acid, esters of methacrylic acid, vinyl compounds, maleic esters, and fumaric esters.

6. The seawater erodible polymer of Claim 5 in which B is selected from methyl acrylate, ethyl acrylate, propyl acrylate, n-butyl acrylate, t-butyl acrylate, sec-butyl acrylate, 2-ethylhexyl acrylate, cyclohexyl acrylate, phenyl acrylate, n-octyl acrylate, 2-hydroxyethyl acrylate, hydroxy-n-propyl acrylate, hydroxy-i-propyl acrylate, glycidyl acrylate, 2-methoxyethyl acrylate, 2-methoxypropyl acrylate, methoxytriethyleneglycol acrylate, 2-ethoxyethyl acrylate, ethoxydiethyleneglycol acrylate, methyl methacrylate, ethyl methacrylate, propyl methacrylate, n-butyl methacrylate, t-butyl methacrylate, sec-butyl methacrylate, 2-ethylhexyl methacrylate, cyclohexyl methacrylate, 2-hydroxyethyl methacrylate, glycidyl methacrylate, 2-methoxyethyl methacrylate, 2-methoxypropyl methacrylate, methoxytriethyleneglycol methacrylate, and 2-ethoxyethyl methacrylate, hydroxy-n-propyl(meth)acrylate, hydroxy-i-propyl methacrylate, phenoxyethyl methacrylate, butoxy ethyl methacrylate, isobornyl (meth)acrylate, neopentyl glycolmethylether propoxylate acrylate, poly(propylene glycol) methylether acrylate, ethoxydiethyleneglycol methacrylate, acrylic acid, methacrylic acid, 2-butoxyethyl acrylate, crotonic acid, di(ethylene glycol) 2-ethylhexyl ether acrylate, di(ethylene glycol) methyl ether methacrylate, 3,3-dimethyl acrylic acid, 2-(dimethylamino) ethyl acrylate, 2-(dimethylamino) ethyl methacrylate, ethylene glycol phenyl ether acrylate, ethylene glycol phenyl ether methacrylate, 2(5H)-furanone, hydroxybutyl methacrylate, methyl-2(5H)-furanone, methyl trans-3-methoxyacrylate, 2-(t-butylamino)ethyl methacrylate, tetrahydrofurfuryl acrylate, 3-tris(trimethylsiloxy)silyl propyl methacrylate, tiglic acid, trans-2-hexenoic acid, vinyl acetate, vinyl propionate, vinyl butyrate, vinyl benzoate, dimethyl maleate, diethyl maleate,

di-n-propyl maleate, diisopropyl maleate, di-2-methoxyethyl maleate, dimethyl fumarate, diethyl fumarate, di-n-propyl fumarate, diisopropyl fumarate, styrene, vinyltoluene, alpha-methylstyrene, N,N-dimethyl acrylamide, N-t-butyl acrylamide, N-vinyl pyrrolidone, and acrylonitrile.

7. The seawater erodible polymer of Claim 1 wherein said polymer has a molecular weight in the range from 1,000 to 200,000 g/mol.

8. The polymer of Claim 1 wherein monomer B comprises methyl methacrylate.

9. A polymer comprising the reaction product of monomer A as defined in Claim 1 with two or more ethylenically unsaturated monomers of group B as defined in Claim 1 in the presence of a polymerization catalyst or initiator and characterized by residue of monomer A in said polymer of above 9 to about 20 mole percent of the polymer.

10. The polymer of Claim 9 where at least one R is selected from unsubstituted aryl, phenyl, aryl substituted by one or more chlorine, fluorine, bromine, iodine, alkyl, perfluoroalkyl, napthyl, fluorenyl, anthracenyl, phenanthrenyl, pyrenyl, alkylether, substituted alkylether, arylether, substituted arylether; amino substituted group or mixtures thereof and the polymer is characterized by an Erosion Rate of from 2 to 15 microns per month.

11. The polymer of Claim 9 wherein monomer A is triphenylsilyl acrylate or triphenylsilyl methacrylate.

12. The polymer of Claim 9 wherein said polymer has a molecular weight in the range from 1,000 to 200,000 g/mol.
13. A polymer composition comprising the polymer of Claim 1 and an organic solvent.
14. The polymer composition of Claim 13 further comprising a stabilizing agent selected from a dehydrating agent, a zeolite, an acid neutralizer, an amino containing compound, an antioxidant, a chelator, and an alkoxy silane.
15. A polymer composition comprising the polymer of Claim 9 and an organic solvent.
16. The polymer composition of Claim 15 further comprising a stabilizing agent selected from a dehydrating agent, a zeolite, an acid neutralizer, an amino containing compound, an antioxidant, a chelator, and an alkoxy silane.
17. A self-polishing marine antifouling coating composition comprising the polymer of Claim 1, a toxicant, and a stabilizing agent, and characterized by an Erosion Rate in seawater of about 2 to 15 microns per month.
18. The self-polishing marine antifouling coating composition of Claim 17 wherein said stabilizing agent is present in said composition from 0.1 to 10 weight percent based upon the weight of said composition.

19. The self-polishing antifouling coating composition of Claim 17, further comprising rosin and rosin derivatives.
20. The self-polishing antifouling coating composition of Claim 19 in which the rosin and rosin derivatives are present in the range of 5 to 60 weight percent of the polymer.
21. A self-polishing antifouling coating composition for fresh water or brackish water applications comprising the polymer of Claim 1, a toxicant, and a stabilizing agent, and characterized by an Erosion Rate of about 2 to 15 microns per month in the fresh water or brackish water of the application.